EARLY WARNING SYSTEM (EWS) FOR MONTANA SCHOOLS

Presented by Eric Meredith

7/23/2012

What is an EWS?

- An EWS is a statistical model that can use readily available school, student, and other data to identify students who are at risk of dropping out of school **before** they drop out.
  - The EWS allows educators to intervene early on during the process before a student has reached the point of no return.

What data is available for the EWS model?

- Data stored by the State.
  - Student Data
    - AIM Data
    - Testing Data
  - School data
    - School Demographics
    - Location
  - Census Information
    - Unemployment Rates
    - Populations
- Data stored by the Schools
  - Attendance
  - Transcripts
  - Grades
  - Behavior Events

How is the model developed?

- Want to compare the dropouts to the students that do not dropout.
  - Find the differences between the two groups
- Model is found using Logistic Regression
  - Logistic Regression uses a binary response variable (compares two sets of groups usually called a "success" or "failure", here we will be comparing dropouts and non-dropouts
  - A separate model will be developed for each grade 7-12.
    - Allows for different reasons of dropping out for different grades.

How do we know which variables affect dropouts?

- Statistical methods to determining which variables improve the "fit" of the model.
- Studies in the past have shown certain variables are good predictors (failing a reading/math class in the 6th grade).
- Looking at past data from Montana schools to compare dropouts to non-dropouts.
  - For example – 71.9% of Non Dropouts are "normal" aged students for their grade where 51.7% of Dropouts are "normal" aged.
- Use model to predict dropouts from previous years (pretend it is 2010 and use the data from 2010 to see how well it predicts the dropouts)

So what's the difficult part?

- There are hundreds of variables to consider using in the model.
  - Want to minimize the number of variables in the model, to keep the model as simple as possible, while maximizing the "fit" of the model.
- Getting the data into the correct format.
  - Attendance, grades, and transcript data is kept by the schools and each school stores it differently.
    - A template for how to store and upload this data will be needed to simplify the process for the schools.
- Model will need to be updated as we accumulate more years data and learn how the model is behaving.
  - The model will need to be updated at least on a yearly basis, probably more at first.

The finished product

- For the 2012-2013 school year it will be made available as a pilot program to a group of 8 school systems.
  - Input will be taken from these schools to help improve the model in the future.

- Will be provided to all school systems sometime after that. Could be as early as some point in the 2012-2013 school year but most likely 2013-2014.
  - Model will be made available to schools by using the secure version of the data warehouse.

Pilot Study

- School Systems
  - Butte
  - Belgrade
  - Great Falls
  - Havre
  - Lame Deer
  - Laurel
  - Townsend
  - Wolf Point

- School Systems chosen because they are using the District Edition of Infinite Campus.
  - Also have at least two years of grades, attendance, and transcript data available.
- Also chosen for a variety in size, location and other factors.

What will the school get from the EWS?

- End result of the EWS will be a % or probability of each student dropping out and list the major reasons that student is a high risk student.
  - % can be changed for each school to help shorten the list and make up for differences between schools.

- List of students that are High Risk for dropping out will be produced
  - List can be run at any time during the school year.

Eric Meredith
OPI Data Analyst
emeredith@mt.gov
(406) 444-3642

Montana
Office of Public Instruction
Denise Juneau, State Superintendent
opi.mt.gov